YEAR 9 MATHS – INTRODUCTORY ALGEBRA REVIEW NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This worksheet is intended to remind you of the work you completed during the last 3 weeks. There will be a short test in your next lesson covering all this work.

Reminders: The Language of Algebra (LOA)

A group of letters and numbers within an expression is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The number in the term – *6xy* is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The letter in the term – 7*a* is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7*abc* and *6bca* are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ terms.

The expression *7x + 5y + 3x – 6y* can be ­ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ appear in an expression, they can be ‘collected’ (added or subtracted)

When working on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, you are trying to convert English ‘sentences’ into algebraic ones.

We can evaluate (or work out) an algebraic expression if we \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the pronumerals with their known values.

Expansion, in algebra, means to multiply everything \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the bracket by what is outside.

The acronym FOIL stands for the words \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Drawing a diagram is an excellent aid in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solving.

(pronumeral) (problem) (outer) (simplified) (term) (like) (worded problems)

(first) (coefficient) (10*x* – *y*) (like) (inside) (last) (terms) (inner) (substitute)

Converting worded questions into algebraic expressions

Write each of the following as a mathematical sentence.

1. The sum of *a* and *b*  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The product of *3* and *g*  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The difference between *15* and *h* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. 2 times *x* is subtracted from 5 times *y* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. A piece of rope is 24 metres long. George cuts *k* metres off. How much is left? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Substitution (means ‘replacing’)

If *y = 5x2 + 2x -1*, what does *y* equal if *x = 2?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If *y = 5x2 – 2x – 9*, what does *y* equal if *x*  = -2? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Simplifying (means ‘add or subtract any like terms’)

1. *5y + 2y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*  b) *-9p + 3p = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* c) *2y – 5y + y =* \_\_\_\_\_\_\_\_\_\_\_\_\_

d)  *8ab + 2a2b2 – 5a2b2 + 7ab =*  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ e) *n2 – p2q – 3p2q + 6 + 4pq2 =* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expanding

(Remember that there is a × sign between the number out the front and the bracket & take care with the signs!!)

1. *5 (x + 3)* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) *-4m (2m + 1)*= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) *-5 (m – 2)* = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d) *x (2x – 3y)*= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find the errors (if there are any??)!!

1. *5 (x – 1) = 5x – 1* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. *2(x + 3) = 2x + 5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
3. *8x – 3x = 5* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. *-2 (x – 7) = -2x + 14* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. *x (x + 5) = 2x + 5x* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expanding – requiring a little more effort

1. *3 (a + 2b) + 2 (3a + b)*
2. *7p – 2 – 3 (3p + 4)*

Farmer Brown scenario

Area of square with side *x*

Area of rectangle with dimensions 2 and *x*

Area of rectangle with dimensions 4 and *x*

Area of rectangle with dimensions 2 and 4

Total Area

*4*

*x*

*x*

*2*

Expanding Double brackets using FOIL

1. (a + 2)(a + 3)b) (n – 3)(n – 1)c) (p – 2)(p – 3) d) (3m + 1)(4m – 5)

Special Patterns

Explain how and why you can ‘short-cut’ the FOIL process when expanding this expression: (k + 5)(k – 5)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Explain how and why you can ‘short-cut’ the FOIL process when expanding this expression: (r + 4)2

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Harder ‘Expand & Simplify’ questions (ACTUALLY, not harder!! Just longer!!)

Expand and simplify *(x + 2)(x + 7) + (x + 4)(x + 1)*

Expand and simplify *(x + 6)(x +2) – (x + 3)(x – 1)*

And an application question

A pool is surrounded by a deck. The deck has the same width *(x metres)* all the way around.

The swimming pool has a length of *(2x + 3)* metres and a width of *(x – 1)*  metres. It is quite deep.

1. Draw a diagram of the pool surrounded by the deck. Label the length and width of the pool.
2. In terms of *x*, what is the length of the deck? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. In terms of *x*, what is the width of the deck? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Work out what the area of the decking is, in terms of *x.*
5. If the width of the decking is 1.3 metres wide, what is the area of the decking?
6. If the decking cost $33 per square metre to build, how much would the decking have cost ?